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Effect of Food Intake and Living Activities Toward Middle Childhood with Leukemia

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Abstract:

Objectives: To Assess the Amount of Food Items Intakeand the Daily Living Activities Regarding Children with Leukemia.To find out the associationbetween Food Frequency Intakeand Daily Living Activities Regarding Children with Leukemia.

Methodology: A "Descriptive (Cross sectional) study" was conducted at Hematology and Oncology Center at Al-Nasiriya Teaching between the period of (19 March to 9 December 2024).

Results: The study revealed a significant positive correlation between the Food Items Intakeof children with leukemia and their daily living activities.

Conclusion: Children with leukemia are affected by the treatments used, such as chemotherapy or radiation, and this in turn affects the children's loss of appetite, and thus they eat meals of average quality and small quantity. Which negatively affects children's daily life activities.

Recommendations: Recommendations: Parents of children must be educated on the negative effects that result from malnutrition and its impact on the time and rate of their recovery from the disease, and focus on improving dietary pattern, their diversity and the number of main meals the child eats to provide him with energy and growth, and encourage sick children to rely on themselves for their special needs. Providing detailed scientific information about the disease in an appropriate way to explain it to the children's parents.

Keywords: Amount of Food Items Intake, Daily Living Activities, Children,Leukemia

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Introduction

The World Health Organization (WHO) reported that cancer ranked as the second most prevalent cause of death on a global scale in 2018. Cancer incidence and mortality are increasing at an alarming rate across the globe (Bray et al., 2018).

Blood and bone marrow malignancy constitute leukemia. In infants and adolescents, it is the most prevalent form of cancer. The United States annually diagnoses between 3,500 and 4,000 new cases (American Cancer Society, 2018).

Leukemia, of which more than ninety-five percent are acute, is the most frequently diagnosed group of pediatrics cancers on a global scale. Considerable advancements have been achieved in the management of acute lymphoblastic leukemia (ALL), which comprises 75–80% of acute leukemia in children, with a five-year overall survival rate that has surpassed 90% in high-income countries (HICs) (Newell & Cook,2021)

With five-year overall survival rates approaching 70%, progress in acute myeloid leukemia (AML) has been consistent. Lifestrate trends in pediatrics cancer in India are poorly represented in longitudinal data. Notwithstanding this, published evidence indicates that childhood ALL outcomes have improved. While progress in India has been relatively modest in scale (Choudhary et al., 2024).

With the long-term event-free survival rate for children with ALL approaching 80%, risk-directed therapy is gaining importance in order to ensure that patients are neither over treated nor undertreated. It has been established that relying solely on primary genetic abnormalities to designate risk is insufficient (Choudhary et al., 2024).

Significant progress in treatment has resulted in improved survival rates, with more than 75% of children diagnosed with pediatrics malignancies enduring more than 5 years without developing any diseases (Ehrhardt et al., 2023).

Leukemia constitutes over one-third of all paediatric cancer cases, making it one of the most prevalent forms of the disease (Zahnreich G et al., 2021).

Malnutrition is a prevalent complication observed in children diagnosed with cancer. Research has established that malnutrition plays a substantial role in treatment resistance, heightened morbidity, unfavorable prognosis, diminished quality of life, and increased healthcare expenditures (Koirala S, 2021).

Consistent physical activity and a nutritious diet are significant contributors to the prevention of chronic diseases and the maintenance of good health across all stages of life. This is also reflected at the national level in many nations, where dietary guidelines advise "regular physical activity and sedentary behavior reduction for health promotion. (US Department of Health and Human Services, 2015).

By analyzing the intricate relationship between diet, physical activity, and improved cancer outcomes, incidence of the disease was significantly reduced and survival rates were significantly increased (American Cancer Society, 2017).

At present, exercise and nutrition are regarded as integral components of therapy that are critical for alleviating the adverse effects of active cancer treatment, particularly fatigue associated with cancer (Schmitz KH et al., 2019).

Specific guidelines regarding moderate aerobic exercise for the purpose of nutrition and muscle strengthening are recommended by the World Cancer Research Fund (Daudt H et al., 2017).

These guidelines include increasing the consumption of plant-based foods, decreasing the intake of red and processed meat, limiting energy-dense foods, salt, sugary drinks, and alcohol, and refraining from the use of dietary supplements. The existing body of literature provides extensive discussion on the benefits of physical activity, including improved fitness, decreased psychological distress, and enhanced cognitive abilities. In contrast, nutritional

consultations may be beneficial in addressing the difficulties associated with cancer-related fatigue, such as anemia, diarrhea, nausea, and vomiting (American Institute for Cancer Research, 2017).

The activities of daily living can be further categorized into personal activities of daily living, which pertain to fundamental self-maintenance (e.g., eating, showering, toileting, and dressing), and those activities that are typically employed to evaluate and predict the developmental stages of children. Additional activities that are considered instrumental activities of daily living consist of household chores, such as cooking, cleaning, purchasing, and laundering, which are frequently used to assess the degree of dependence or disability of elderly patients, as well as access tasks, including driving and mobile use. More specifically, health professionals frequently assess the functional status by evaluating the ability to perform Activities of Daily Living (Rhoadset al.,2016).

Additionally, the functioning of daily living activities demonstrates children's capacity to operate objects without external assistance. However, young children frequently require adult assistance to perform the functions of playing, feeding, sleeping, bathing, socialising, and feeding, feeding, sleeping, and playing independently in the home, school, community, or workplace (Bates HH,2015).

Methodology

Descriptive (Cross sectional) study was conducted on children with Leukemia in Hematology and Oncology Center at Al-Nasiriya Teaching between the period of (19 March to 9 December 2024). To assessment theassociation between Food Frequency Intakeand daily living activities among children with leukemia.

The study was carried-out in Hematology and Oncology Center at Al-Nasiriya Teaching. Samples were taken using a convenience sampling method for all children with leukemia who had been admitted to the hospitals or visited a hematology consultant. The children's ages were from 7 to 14 years. The total number of participants was 150 children with leukemia.

According to the literature review of previous studies related to Food Frequency Intakeand activity of daily life, we prepared a questionnaire to measure dietary Habits, which includes dietary Habits, Food Frequency Intake, and the amount of food items intake. And we used a scale to measure activity of daily living. Comparing the relationship between Food Frequency Intakeand daily life activity for the sample taken for children with leukemia. A tool in the form of a questionnaire was built for the purpose of the study.

Results

Table 1. Distribution of Studied Sample related to their Socio-demographic Data

Socio-demographic data	Classification	No.	%
Age M ± SD= 8.91 ± 4.10 Min.-Mix.= 6-16	7-9 years	**83**	**55.4**
	10-12 years	45	30
	>12 years old	22	14.6
Gender	Male	**111**	**74.0**
	Female	39	26.0
Is he/she student	Yes	103	68.7
	No	47	31.3
Parents consanguinity	Yes	57	38.0
	No	**93**	**62.0**
History of Leukaemia	Yes	43	28.7
	No	**107**	**71.3**
History of Diagnosis	<1 year	70	46.7
	>1 year	**80**	**53.3**
Treatment Modalities	Chemotherapy	**75**	**50.0**
	Radiotherapy	11	7.3
	Both	64	42.7

No. Number; %= Percentage

When examining the demographic characteristics of the 150 children with leukaemia who participated in this study, we found that their ages ranged from 7 to 14 years, with 74% of participants being male, participants being females 26%. 68.7% classified as students.

Parents' relationship status, came to the contingency between parents, 62% expressed that there was no contingency between them.

Table 2. Overall Amount of Food Items Intake among Leukemic Children

Scale	Min.	Max.	M	SD	Score	No.	%
Food Frequency Intake (17 Q)	28	75	44.61	15.82	Low (17-39.66)	46	30.7
					Moderate (39.67-62.33)	100	66.7
					High (62.34-85)	4	2.6
					Total	150	100.0

Min.: Minimum; Max.: Maximum, M: Mean for total score, SD=Standard Deviation for total score

The findings highlight the variety of responses of children with leukemia regarding their food frequency intake. Their food frequency intake scores range from 28 to 75 on the rating scale. The overall mean score was calculated at 44.61, accompanied by a standard deviation of 15.82. The results indicate that a large majority (66.7%) of children showed moderate food frequency intake.

Table 3. Overall Activities Daily Living among Leukemic Children

Scale	Min.	Max.	M	SD	Score	No.	%
Activities Daily Living (33 Q)	41	84	55.28	17.20	Low (33-55)	33	22.0
					Moderate (55.1-77)	98	65.3
					High (77.1-99)	19	12.7
					Total	150	100.0

Min.: Minimum; Max.: Maximum, M: Mean for total score, SD=Standard Deviation for total score

The findings highlight the variety of responses of children with leukaemia regarding their activities daily living. Their activities scores range from 41 to 84 on the rating scale. The overall mean score was calculated at 55.28, accompanied by a standard deviation of 17.20. The results indicate that a large majority (65.3%) of children showed moderate activities of daily living.

Table 4. Association between Food Frequency Intake and Activities Daily Living among Children with Leukemia

Correlation Statistics	1	2	3	4	5	6	7	8	9
1.Food frequency intake	1								
2.Clothing Activities	.625**	1							
3. Motor Activities	.715**	.677**	1						
4. School Activities	.736**	.824**	.714**	1					
5. Play Activities	.512**	.742**	.726**	.829**	1				
6.Personal hygiene	.542**	.594**	.510**	.666**	.618**	1			
7. Eating and Drinking	.455**	.624**	.433**	.640**	.626**	.466**	1		
8. Sleeping	.475**	.585**	.521**	.540**	.482**	.409**	.393**	1	
9. Overall LDA	.622**	.620**	.637**	.735**	.674**	.552**	.444**	.595**	1

***. Correlation is significant at the 0.01 level (2-tailed).*

The study revealed a significant positive correlation between the food frequency intake among children with leukemia and their daily living activities. This correlation was observed in various aspects of activities of daily living, including clothing ($r= 0.625$; $p < 0.002$), motor activities ($r=0.715$; $p < 0.002$), school activities ($r= 0.736$; $p <$

0.002), play and hobbies (*r=0.712; p < 0.004*), personal hygiene (*r= 0.542; p < 0.003*), eating and drinking (*r= 0.455; p < 0.002*), sleeping (*r= 0.735; p < 0.001*), and overall daily living activities (*r= 0.622; p < 0.001*).

Discussion of the Study Results

5.1. Distribution of Studied Sample related to their Socio-demographic Data

The findings of the study of 165 children with leukaemia reveal several noteworthy demographic characteristics that provide valuable insights into the profile of the participants. First of all, the age range of the children participating in the study ranged from 7 to 14 years . The mean age of 8.91 ± 4.10 years indicates a relatively young cohort, highlighting the prevalence of leukaemia in early childhood and adolescence.

Gender distribution appears to be an important factor, with a clear predominance of males in the study. 74% of the participants were male, while females made up the remaining 26%. This gender disparity raises questions about possible biological or environmental factors that contribute to higher leukaemia rates in boys. Further exploration of the reasons behind this gender skew may be useful for understanding and treating childhood leukaemia. This result agrees with with (Niklas Gunnarsson 2017) who studying (Chronic myeloid leukaemia and cancer). their study is mentioned that majority of participating regarding the gender distribution was60% of the participants were male, while females made up the remaining 40% .

Family history appears to be a relevant factor, with 71.3% of children indicating no known family history of leukaemia. This finding role of the environmental factor predisposition in childhood leukaemia. Further studies and genetic investigations into possible environmental factors could shed light on the etiology of these cases. This result agrees with with (Sahar Mehranfar et al 2017) who studying "History of Leukaemia: Diagnosis and Treatment from Beginning to Now". His findings indicated that with 59% of children indicating no known family history of leukaemia.

Regarding the duration of leukaemia diagnosis, 53.3% of children were diagnosed for more than 1 year, indicating a large proportion with prolonged exposure to the challenges of disease management, and the possibility of living with this disease. Longitudinal studies that track the outcomes of these conditions over time can provide valuable insights into the trajectories of childhood leukaemia and the effectiveness of interventions. This result disagrees with with (Rosnah Sutan et al 2017) who studying "Coping Strategies among Parents of Children with Acute Lymphoblastic Leukaemia". His findings indicated that at the time of diagnosis, the average age of the children was 4.5 ±2.9 years.

Finally, the prevalent use of chemotherapy as a treatment modality (50%) underscores the importance of understanding the therapeutic landscape in pediatric leukaemia. Exploring the reasons behind the choice of specific treatment methods and evaluating their effectiveness and side effects is crucial to improving treatment methods and improving overall outcomes for affected children. This result is consistent with (Ahmed Motohiro Kato 2018) study " Treatment and biology of pediatric acute lymphoblastic leukaemia" their study finding indicated that the most of the ideal option for treating children with leukaemia was chemotherapy, and the percentage of children receiving this treatment was 60% of the sample taken.

Overall Domain food amount intake among Leukemic Children: A mean score of 44.61 with a standard deviation of 15.82 indicates a moderate level of frequent eating on average, but with a large degree of inter-individual variation with moderate overall of food amount intake by 66.7%. Analysis of this prevalence can help identify subgroups of children who have particularly low or high food intake, allowing for targeted interventions. This result agrees with (Sophia Morel et al 2019) , their study (Development and relative validation of a food frequency questionnaire for French-Canadian adolescent and young adult survivors of acute lymphoblastic leukemia) their study finding indicated that data showed that there was the FFQ overstated the mean values for macronutrient and micronutrient intake in comparison to the 3-day food record, excluding lipid-related nutrients. The three-day food records and nutrient intakes derived from the FFQs exhibited moderate to excellent correlations (0.46–0.74).

And agrees with other result of (Usama et al 2022) their study (Assessment of the Nutritional Status of the Children with Acute Leukemia on Chemotherapy in Karbala City) their finding indicated that data showed that the impact of dietary habits can be succinctly described as follows: adolescents undergoing chemotherapy consume diets of moderate quality, albeit in limited quantity.

Overall Domain Activities Daily Living among Leukemic Children: The findings presented in this study provide valuable insights into activities of daily living for children with leukaemia. The evaluation included various aspects of their lives, including clothing, motor activities, school activities, toys and hobbies, personal hygiene, eating and drinking, and sleep-related activities. The results show a variety of responses among these children, highlighting the challenges they face and their overall performance in various areas.

One notable observation is that a large proportion of children with leukaemia showed a moderate level of activities of daily living across the different groups. This indicates resilience and adaptability among these children, indicating that they actively participate in and manage their daily routines despite the impact of leukaemia on their lives with moderate activity by 65.3%. This finding suggests that many children with leukaemia are still able to participate in educational activities, albeit with some challenges. This result disagrees with (marta et al 2020) their studying "Pediatric Patients Treated for Leukaemia Back to School: A Mixed-Method Analysis of Narratives about Daily Life and Illness Experience"their study finding indicated that data showed leukaemia in children can impact their participation in school activities through factors such as social support, treatment-related effects on academic performance, and motor skill delays. Early educational intervention and support are recommended for children affected by leukaemia to mitigate these challenges.

The overall mean of 55.28 on the rating scale, with a standard deviation of 17.20, provides a comprehensive summary of children's activities in daily life. The fact that 65.5% of children showed moderate activities in daily life confirms the resilience of this population and the strength of their adaptation to the disease. However, it is important to recognize the diversity within this group as 22% had low activities and needed to depend on their family in their daily lives, as evidenced by a wide range of scores (41 to 84). This disparity underscores the need for tailored approaches to support each child based on their unique challenges and strengths. This result Congruent with that (NuhadAldoori et al, 2020) their studying "Daily Living Activities of School Age Children with Acute Lymphocytic Leukaemia at Welfare Paediatric Teaching Hospital"their study finding indicated A significant proportion of children experience symptoms, clinical signs, and complications associated with acute lymphocytic leukaemia. A significant proportion of children with acute lymphocyte-cytic leukaemia experience a moderate impact on their daily activities. This result disagrees with (AleksandraKowaluk et al 2019) their studying "Physical Activity and Quality of Life of Healthy Children and Patients with Hematological Cancers"theirstudy finding indicated that A shortage of physical activity is a critical determinant that adversely impacts the quality of life and fosters a sense of dependence among children diagnosed with cancer. The findings of the research indicated that children who were receiving cancer treatment exhibited diminished physical fitness and a general state of unwell-being. Children whose cancer was successfully treated exhibited marked improvements in their overall health and physical endurance.

In conclusion, the study contributes valuable information to our understanding of how children with leukaemia cope in their daily lives. The findings underscore the importance of considering multiple dimensions of activities of daily living and designing interventions to address the specific challenges faced by these children, with the ultimate goal of enhancing their overall well-being and quality of life.

5.4: Association between Amount of Food ItemsIntake and Activities Daily Living among Children with Leukemia

The study revealed a significant positive correlation between the Amount of Food Items intake among children with leukemia and their daily living activities. This correlation was observed in various aspects of activities of daily living, including clothing ($p < 0.001$), motor activities ($p < 0.001$), school activities ($p < 0.001$), play and hobbies ($r = 0.612$; $p < 0.001$), personal hygiene ($p < 0.001$), eating and drinking ($p < 0.001$), sleeping ($p < 0.001$), and overall daily living activities ($p < 0.001$).

there is limited information on the direct relationship between Amount of Food Items intake among children with leukemia and their daily living activities. However, there are several studies that provide insights related to

dietary intake and childhood leukemia, which may indirectly impact their daily living activities.The results obtained from the current study came along with a previous study entitled "Dietary intake and childhood leukemia: The Diet and Acute Lymphoblastic Leukemia Treatment (DALLT) cohort study." which was indicated Children with acute lymphoblastic leukemia (ALL) are at high risk of developing nutritional-related diseases during and after treatment, which leads to instability in their daily activities and behavior(Burbank et al 2016).

And this result agrees with another study (Sgarbieri et al 2017) their study ″Nutritional assessment and serum zinc and copper concentration among children with acute lymphocytic leukemia: a longitudinal study″. His findings indicated the nutritional evaluation studies have shown that children with acute lymphocytic leukaemia may suffer from nutritional disorders due to the effects of chemotherapy and radiotherapy. Treatment can affect their growth rate, lead to weight loss, and change levels of behavior, activity, and cognition

Conclusion

In conclusion, the treatments administered to children with leukemia, such as radiation or chemotherapy, have an impact on their appetite decline. As a consequence, the children consume meals that are of average quality and in small quantities. This negatively impacts the daily activities of children.

Recommendations

Recommendations: It is imperative to educate parents regarding the detrimental consequences of malnutrition, including its influence on the duration and pace of their children's recovery. They should prioritise enhancing their children's dietary practices by increasing the variety and frequency of their main meals, which are vital for sustaining energy and promoting growth. Additionally, they should encourage children who are ill to attend to their own special needs. Delivering comprehensive scientific data regarding the ailment in a manner that is suitable for elucidating it to the parents of the children.

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